

# SERVICE MANUAL

## E27B

### Compact Hydraulic Excavator

*PIN number PVI3 - and higher*

Part number S5PV0023E02  
English  
August 2010



# COMPACT HYDRAULIC EXCAVATOR

SHOP  
MANUAL      model    E27B

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MAINTENANCE SPECIFICATIONS

SYSTEM

DISASSEMBLING

TROUBLESHOOTING

E/G

OPT.

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## GENERAL SAFETY INFORMATION

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*Avoid injury!*

*The safety alert symbol is used to alert you to potential personal injury hazards. Carefully read and observe all the precautionary advice contained in this manual. Failure to comply could result in death or serious injury.*

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- (1) Most accidents involving machine operating and maintenance can be avoided by following basic safety rules and precautions. Read and understand all the safety messages in this manual, the safety manual and the safety signs on the machine before you operate or service the machine. See your dealer if you have any questions.

### NOTICE:

*NOTES, DANGERS, WARNINGS and CAUTIONS contained in the manual and on the machine should be read and understood by all personnel before starting any work with or on the machine.*

- (2) Read the operator's manual and make sure you understand the machine controls. All equipment has a limit. Make sure you understand the speed, brakes, steering, stability, and load characteristics of this machine.
- (3) DO NOT remove the operator's manual or the safety manual from the machine.
- (4) The safety information given in this manual does not replace safety codes, insurance needs, federal, state, or local laws. Make sure that your machine has the correct equipment according to these rules or laws.
- (5) Additional safety messages are used in the text of the manual to show specific safety hazards.
- (6) Operation, inspection and maintenance should be performed at designated intervals. It may be necessary to shorten the intervals based on machine operating conditions.
- (7) The safety information contained in the manual is intended only to supplement safety codes, insurance requirements, local laws, rules and regulations.
- (3) Pay close attention to safety messages in this manual and on the machine. All safety messages are identified by either "DANGER", "WARNING" and/or "CAUTION".

- 1) **DANGER**- Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury and is represented as follows:



- 2) **WARNING**- Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury and is represented as follows:



- (3) **CAUTION**- Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against possible damage to the machine and its components and is represented as follows:



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## (SAFETY PRECAUTIONS)

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### WARNING

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*Read, understand and follow all safety precautions contained in this manual before performing any inspection or maintenance procedures on this machine, its system or components. Failure to comply could result in death or serious injury.*

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Use caution when performing service work. A knowledge of the system and or components is important before the removal or disassembly of any component.

Because of the size of some of the machine components, check the weights noted in this manual. Use proper lifting procedures when removing any components. Weight of components table is shown in the Specification section.

- (1) Read and understand all Warning plates and decal on the machine before Operating, Maintaining or Repairing this machine.
- (2) Always wear protective glasses and protective shoes when performing maintenance or service. Wear protective glasses when using hammers, punches or drifts on any part of the machine or attachments. Use welders gloves, hood/goggles, apron and the protective clothing if welding is necessary. Do not wear loose fitting or torn clothing. Remove all rings from fingers, loose jewelry, confine long hair and loose clothing before working on this machinery.
- (3) Disconnect the battery and hang a "Do Not Operate" tag in the Operator's Compartment. Remove the ignition keys.
- (4) If possible, make all repairs with the machine parked on a firm level surface. Block the machine to prevent unexpected movement.
- (5) Do not work on any machine that is supported only by lift, jacks or a hoist. Always use blocks or jack stands, capable of supporting the machine, before performing any disassembly.

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### WARNING

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*Wear goggles, safety shoes, hard hat, work clothes and work gloves to perform inspection and maintenance on this machine. Failure to comply could result in death or serious injury.*

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- (6) Relieve all pressure in air, oil or water systems before any lines, fittings or related items are disconnected or removed. Always make sure all raised components are blocked correctly and be alert for possible pressure when disconnecting any device from a system that utilizes pressure.
- (7) Lower the bucket, dozer, or other attachments to the ground before performing any work on the machine. If this cannot be done, make sure the bucket, dozer, ripper or other attachment is blocked correctly to prevent it from dropping unexpectedly.
- (8) Use steps and grab handles when mounting or dismounting a machine. Clean any mud or debris from steps, walkways or work platforms before using. Always face to the machine when using steps, ladders and walkways. When it is not possible to use the designed access system, provide ladders, scaffolds, or work platforms to perform safe repair operations.
- (9) To avoid back injury, use a hoist when lifting components which weigh 20 kg (45 lbs) or more. Make sure all chains, hooks, slings, etc., are in good condition and are the correct capacity. Be sure hooks are positioned correctly. Lifting eyes are not to be side loaded during a lifting operation.
- (10) To avoid burns, be alert for hot parts on machines which have just been stopped and hot fluids in lines, tubes and compartments.
- (11) Be careful when removing cover plates. Gradually back off the last two cap screws or nuts located at opposite ends of the cover or device and carefully pry cover loose to relieve any spring or other pressure, before removing the last two cap screws or nuts completely.
- (12) Use caution when removing filler caps, breathers and plugs on the machine. Hold a rag over the cap or plug to prevent being sprayed or splashed by liquids under pressure. The danger is even greater if the machine has just been stopped because fluids can be hot.
- (13) Always use the proper tools that are in good condition and that are suited for the job at hand. Be sure you understand how to use them before performing any service work.
- (14) Reinstall all fasteners with the same part number. Do not use a lesser quality fastener if replacements are necessary.

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**⚠ WARNING ⚠**

*Disconnect both the positive (+) and negative (-) battery cables from the battery before welding on the vehicle. Attach the welder ground cable no more than 0.61 m (2 ft) from the part being welded. Do not connect the ground cable to the welder to the cooling plate for the engine control module (ECM) or the engine control module itself. Welding on the engine or engine mounted components is not recommended or damage to the engine or components can result. Failure to comply could result in death or serious injury.*

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- (15) Repairs which require welding should be performed only with the benefit of the appropriate reference information and by personnel adequately trained and knowledgeable in welding procedures. Determine type of metal being welded and select correct welding procedure and electrodes, rods or wire to provide a weld metal strength equivalent at least to that of the parent metal. Make sure to disconnect battery before any welding procedures are attempted.
- (16) Do not damage wiring during removal operations. Reinstall the wiring so it is not damaged nor will be damaged in operation of the machine by contacting sharp corners, or by rubbing against some object or hot surface. Do not connect wiring to a line containing fluid.
- (17) Be sure all protective devices including guards and shields are properly installed and functioning correctly before starting a repair. If a guard or shield must be removed to perform the repair work, use extra caution and replace the guard or shield after repair is completed.
- (18) The maintenance and repair work while holding the bucket raised is dangerous due to the possibility of a falling attachment. Lower the attachment and place the bucket on the ground before starting the work.
- (19) Loose or damaged fuel, lubricant and hydraulic lines, tubes and hoses can cause fires. Do not bend or strike high pressure lines or install ones which have been bent or damaged. Inspect lines, tubes and hoses carefully. Do not check for leaks with your hands. Very small (pinhole) leaks can result in a high velocity oil stream that will be invisible close to the hose. This oil can penetrate the skin and cause personal injury. Use card-board or paper to locate pinhole leaks.

- (20) Tighten connections to the correct torque. Make sure that all heat shields, clamps and guards are installed correctly to avoid excessive heat, vibration or rubbing against other parts during operation. Shields that protect against oil spray onto hot exhaust components in event of a line, tube or seal failure must be installed correctly.
- (21) Do not operate a machine if any rotating part is damaged or contacts any other part during operation. Any high speed rotating component that has been damaged or altered should be checked for balance before reusing.
- (22) Be careful when servicing or separating the tracks (crawlers). Chips can fly when removing or installing a track (crawlers) pin. Wear safety glasses and long sleeve protective clothing. Tracks (crawlers) can unroll very quickly when separated. Keep away from front and rear of machine. The machine can move unexpectedly when both tracks (crawlers) are disengaged from the sprockets. Block the machine to prevent it from moving.

#### **STOP ENGINE**

Do NOT attempt any maintenance with engine running. Always stop the engine and allow machine to cool.

#### **HOT SURFACE AND FLUIDS**

Use caution and wear the proper safety equipment when working around hot areas. Never change oils, engine coolant or filters immediately after a machine has been stopped. Allow machine to cool down before performing maintenance procedure.

#### **CLEANING PARTS**

Use only approved cleaning solvents and proper equipment to clean parts.

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**⚠ WARNING ⚠**

*Never use gasoline, diesel fuel or other flammable solvents to clean parts. Always clean parts in a well ventilated area. Failure to comply could result in death or serious injury.*

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